

Innovative Stirling Convertor for Distributed Electric Power from Thermal Energy Recovery, Phase I

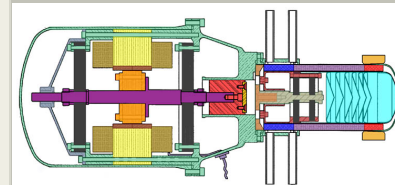
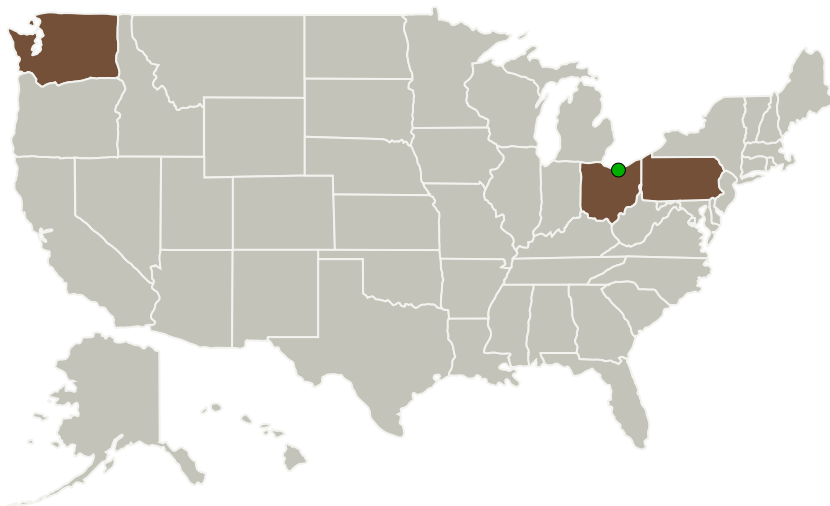
Completed Technology Project (2016 - 2017)



Project Introduction

SCCAQ Energy, LLC (SCCAQ) in collaboration with Temple University and Infinia Technology Corporation (ITC) proposes to develop a Reliable Stirling Convertor (RSC) prototype free-piston Stirling (FPS) engine designed to address NASA needs for space power applications. This STTR proposal is specifically addressed to Topic T3 (Space Power and Energy Storage), with an emphasis on Subtopic T3.01 (Energy Transformation and Multifunctional Power Dissemination). The RSC offers multifunctional versatility that can efficiently convert thermal energy from a wide variety of heat sources into useful distributed electric power. Examples include capturing waste heat from a rocket exhaust, utilizing concentrated solar power, and conversion of nuclear heat energy from either radioisotope decay or fission energy. The reference design starting point will be the Technology Demonstration Convertor (TDC) that was developed by Infinia Corporation in the 1999 to 2006 time frame as a Radioisotope Power System (RPS). SCCAQ proposes to significantly upgrade the TDC design using newer technology and innovations to increase efficiency and robustness, while reducing size and weight. The proposed effort will be supported by SEEE lab of Temple University and will heavily leverage support from Infinia Technology Corporation.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
SCCAQ Energy, LLC	Lead Organization	Industry Minority-Owned Business, Women-Owned Small Business (WOSB)	Richland, Washington
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio
Temple University	Supporting Organization	Academia	Philadelphia, Pennsylvania

Primary U.S. Work Locations

Ohio	Pennsylvania
Washington	

Project Transitions

▶ **June 2016:** Project Start

✓ **June 2017:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/139627>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

SCCAQ Energy, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

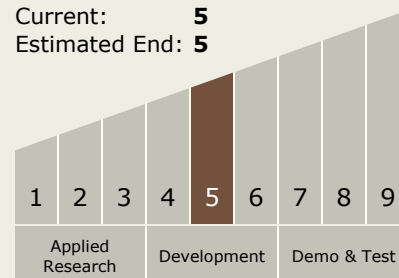
Carlos Torrez

Principal Investigator:

Songgang Qiu

Technology Maturity (TRL)

Start: 5
Current: 5
Estimated End: 5

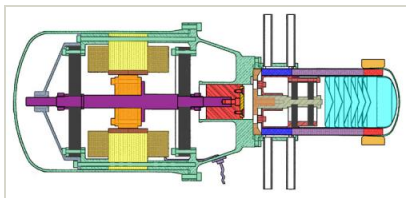


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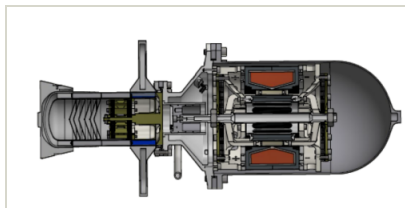


Images



Briefing Chart Image

Innovative Stirling Convertor for Distributed Electric Power from Thermal Energy Recovery, Phase I
(<https://techport.nasa.gov/image/127998>)



Final Summary Chart Image

Innovative Stirling Convertor for Distributed Electric Power from Thermal Energy Recovery, Phase I
Project Image
(<https://techport.nasa.gov/image/129870>)

Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
 - └ TX03.1 Power Generation and Energy Conversion
 - └ TX03.1.4 Dynamic Energy Conversion

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System